

negatives should be employed with the object in view of their suitability for making lantern slides therefrom. The process, 'par excellence,' is the dry collodion process, and I have used a home-made collodion emulsion for many years. Plates prepared by this process have a structureless film, and give perfect detail, with a wide range of gradation in the image from clear glass to pure blacks. They have also the merit of cheapness, rapidity of preparation and drying, with permanency of the resulting slide. In most cases, the ordinary method of preparation of objects will be satisfactory, *i.e.*, treatment with liquor potassa, dehydration with alcohol, clearing with oil of cloves or turpentine, and mounting in Canada balsam. A good formula for the latter is—Canada balsam (dried), 2 parts; benzole and turpentine, of each 1 part. For some objects, however, Canada balsam is unsuitable, such as the softer and more colourless insect structures. For these, glycerine, in the form of Farrant's medium, will answer best; for others, such as some scales and wings of lepidoptera, the dry method of mounting is more suitable.

It is desirable to keep an indexed record of the subjects photographed, giving such particulars as—name of specimen, generic and specific, whether male or female, where obtained, how prepared, objective used, amount of magnification in diameters, exposure and date, and other facts that require notice. Such a record is always valuable for reference.

EXPLANATION OF PLATES VIII AND IX : NOTOLOPHUS (ORGYIA) ANTIQUA.

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| Fig. 1. Male insect, $\frac{3}{8}$ size. | Fig. 7. Cocoons, $\frac{3}{8}$ size. |
| Fig. 2. Female insect depositing eggs, $\frac{3}{8}$ size. | Fig. 8. Pupæ, male and female, $\frac{3}{8}$ size. |
| Fig. 3. Eggs, group on cocoon $\times 1\frac{1}{2}$. | Fig. 9. Rudimentary wings of female, $\times 8$. |
| Fig. 4. Eggs $\times 10$. | Fig. 10. Hairs on larva $\times 10$. |
| Fig. 5. Larva, newly emerged $\times 10$. | Fig. 11. " " " $\times 60$. |
| Fig. 6. Larva, adult on lime leaf, $\frac{3}{8}$ size. | Fig. 12. Proleg of larva $\times 32$. |

NOTE.—Figs. 1, 2, 3, 6, 7, and 8 have been photographed with a wide angle photographic lens. Fig. 4 by reflected light. Figs. 5, 9, 10, 11, and 12 are examples of low power photomicrography.

Catalogue of the Palæarctic Urbicolides.

By J. W. TUTT, F.E.S.

Our study of the Palæarctic "skippers" (*A Natural History of the British Butterflies*, pp. 80-298) has carried us over a considerable amount of ground, and, in conclusion, we have drawn up the following catalogue of the species that are taken within the Palæarctic area, with the addition of some few varieties of the species that we have specially studied, that spread into the Nearctic region. It will be observed that there are many additions to those in Staudinger and Rebel's *Catalog*, 3rd ed., 1901, but even so, we are not sure that the list is quite as complete as it should be, for, although we have cut out the species that inhabit western China up to the borders of Thibet, without passing the boundaries of the latter, the general resemblance of some of these species to other outlying Palæarctic forms, makes us doubt whether such should not be rightly included in our list. On the whole, however, we have decided to exclude these, and believe the following will be found a fairly accurate list of the "skippers" inhabiting the Palæarctic region:—

URBICOLIDÆ.

HESPERIIDÆ.

PHOCIDIDI.

Orthophoetus, Wats.*omeia*, Leech*Capila*, Moore
translucida, Leech*Achalarus*, Scud.*bifasciatus*, Brem.*var. contractus*, Leech*simplex*, Leech*proximus*, Leech*Celenorhinus*, Hb.
maculosa, Feld.
consanguinea, Leech*tibetana*, Mab.*Daimio*, Murr.
tethys, Mén.
var. chinensis, Staud.*sinica*, Feld.*diversa*, Leech*Satarupa*, Moore
nymphalis, Spr.

HESPERIIDÆ.

NISONIADIDI.

Hallia, Tutt
marloyi, BdV.
pelias, Leech
var. erebus, Grum-Grsh.
Nisoniades, Hb.
tages, Linn.
ab. isabellæ, Lamb.
ab. alcoides, Tutt
ab. transversa, Tutt
ab. variegata, Tutt
ab. brunnea-unicolor, Tutt
ab. brunnea-alcoides, Tutt
ab. brunnea-transversa,
Tutt
ab. brunnea-variegata,
Tutt
ab. unicolor, Frr.
ab. approximata, Lowe
ab. suffusa-alcoides, Tutt
ab. suffusa-transversa,
Tutt
ab. suffusa-variegata, Tutt
ab. fulva, Banks
var. cervantes, Grasl.
ab. clarus, Carad.
var. popoviana, Nordm.
var. sinina, Grum-Grsh.
montanus, Brem.
var. nigrescens, Leech
leechii, Elw. and Edw.

ERYNNIDI.

Erynnis, Schrk.
alceae, Esp.
var. australis, Zell.
altheæ, Hb.
var. bæticus, Rbr.
lavatheræ, Esp.

HESPERIDI.

Sloperia, Tutt
poggei, Led.*var. lutulentus*, Grum-

Grsh.

Muschampia, Tutt*proto*, Esp.*var. mohammed*, Obth.*leuzeæ*, Obth.*staudingeri*, Spr.*var. plurimacula*, Chr.*var. proteus*, Staud.*var. prometheus*, Grum-

Grsh.

Favria, Tutt*tessellum*, Hb.*var. nomas*, Led.*var. dilutior*, Rühl*var. gigas*, Brem.*var. kuenlunus*, Grum-

Grsh.

cribellum, Evers.*var. obscurior*, Staud.*nobilis*, Staud.*Hesperia*, Fab.*antonia*, Spr.*var. gigantea*, Staud.*sidae*, Esp.*carthami*, Hb.*var. moeschleri*, H.-Sch.*var. valesiaca*, Rühl*cinarae*, Rbr.*andromedæ*, Wallgrn.*centaureæ*, Rbr.*serrulæ*, Rbr.*ab. tarasoides*, Rbr.*var. caecus*, Frr.*var. major*, Staud.*var. alveoides*, Staud.*cacaliae*, Rbr.*speyeri*, Staud.*alveus*, Hb.*ab. funginus*, Schilde*var. conyzæ*, Gn.*var. carlineæ*, Rbr.*var. onopordi*, Rbr.*var. cirsii*, Rbr.*var. iberica*, Grum-Grsh.*var. sifanicus*, Grum-Grsh.*alpina*, Ersch.*var. darwazica*, Grum-

Grsh.

malvæ, Linn.*ab. albina*, Tutt*ab. taras*, Bergs.*ab. intermedia*, Schilde*ab. zagrabiensis*, Grund*ab. fasciata*, Tutt*ab. restricta*, Tutt*ab. brunnea*, Tutt*var. (et ab.) australis*, Tutt*var. melotis*, Dup.*var. hypoleucus*, Led.*var. pyrenaica*, Tutt*var. andalusica*, Tutt*var. alpina*, Tutt*ab. rufa*, Tutt*? var. malvooides*, Elw. and

Edw.

Bremeria, Tutt
 bieti, Obth.
 maculatus, Brem.
 var. amurensis, Staud.
 var. thibetanus, Obth.
 var. zona, Mab.
 var. albistriga, Mab.
 var. sinicus, Butl.
 oberthueri, Leech
 Powellia, Tutt
 geron, Wats.
 phlomidis, Hch.-Sch.
 var. jason, Kind.
 orbifer, Hb.
 ab. eucerate, Frr.
 var. tesselloides, Hch..-
 Sch.
 ab. hilaris, Staud.
 var. lugens, Staud.
 sao, Hb.
 ab. eucrate, Ochs.
 var. therapne, Rbr.
 var. ali, Obth.

URBICOLIDÆ.

AEROMACHINÆ.

AEROMACHIDI.

Taractrocera, Butl.
 flavoides, Leech
 Ampittia, Moore
 trimacula, Leech
 delaillama, Mab.
 Aeromachus, Nicév.
 chinensis, Elw. and Edw.
 pieceus, Leech
 inachus, Mén.
 catocyanea, Mab.

CYCLOPIDINÆ.

CYCLOPIDIDI.

AUBERTIA, Obth.
 micio, Obth.
 dieckmanni, Graes.
 var. gemmatus, Leech
 christophi, Grum-Grsh.
 niveomaculatus, Obth.
 flavomaculatus, Obth.
 argyrostigma, Evers.

Cyclopides, Hb.
 pulchra, Leech
 abax, Obth.
 houangty, Obth.
 silvius, Knoch
 palæmon, Pall.
 ab. aurantia, Tutt
 ab. excessa, Tutt
 ab. restricta, Tutt
 ab. lutea-excessa, Tutt
 ab. lutea-restricta, Tutt
 ab. meliceretes, Schultz
 (esperi, Tutt)
 ab. circumcincta, Tutt
 var. (et ab.) alboguttata,
 Chr.

var. mandan, Edw.
 var. mesapano, Scudd.
 var. skada, Edw.

Heteropterus, Dum.
 morpheus, Pall.
 Leptalina, Mab.
 unicolor, Brem.
 ab. ornatus, Brem.
 Dejeania, Obth.
 bicolor, Obth.
 Apostictopterus, Leech
 fuliginosus, Leech

THYMELICINÆ.

THYMELICIDI.

Adopæa, Billberg
 lineola, Ochs.
 ab. pallida, Tutt
 ab. clara, Tutt
 ab. brunnea, Tutt
 ab. suffusa, Tutt
 ab. ludovicæ, Mab.
 ab. semicolon, Staud.
 ab. intermedia, Tutt
 var. (et ab.) major, Tutt
 ab. major-clara, Tutt
 flava, Brünnich
 ab. pallida, Tutt
 ab. pallida-virescens, Tutt
 ab. suffusa*, Tutt
 ab. suffusa-virescens, Tutt
 ab. reversa, Tutt
 ab. obscura, Tutt
 var. iberica, Tutt
 var. syriaca, Tutt
 var. (et ab.) major, Tutt

Thymelicus, Hübner

sylvatica, Brem.
 var. occidentalis, Leech
 hyrax, Led.
 leonina, Butl.
 var. astigmata, Leech
 nervulata, Mab.
 stigma, Staud.
 hamza, Obth.
 christi, Rebel
 acteon, Rott.
 ab. virescens, Tutt
 ab. distincta, Tutt
 ab. obsoleta, Tutt
 ab. clara, Tutt
 ab. extensa, Tutt

URBICOLINÆ.

URBICOLIDI.

Urbicola, [Linn.,] Barb.
 comma, Linn.
 ab. clara, Tutt
 ab. intermedia, Tutt
 ab. suffusa, Tutt
 ab. pallidapuncta, Tutt
 ab. extrema, Tutt
 ab. confluua, Tutt
 ab. juncta, Tutt

* Owing to a slip (*Brit. Butts.*, p. 107), *A. flava* ab. *suffusa* is said to be a parallel form with *A. lineola* ab. *suffusa*. This is wrong, as it is parallel with *A. lineola* ab. *brunnea*. It is *A. flava* ab. *obscura* that is parallel with *A. lineola* ab. *suffusa*.

<i>ab.</i> centripuncta, Tutt	<i>var.</i> hyrcana, Christ.
<i>var.</i> (<i>et ab.</i>) flava, Tutt	<i>var.</i> (<i>et ab.</i>) venata, Brem.
<i>var.</i> (<i>et ab.</i>) pallida, Tutt	<i>var.</i> tochrana, Rühl
<i>var.</i> dimila, Moore	<i>var.</i> (<i>an spec.</i>) faunus,
<i>var.</i> (<i>et ab.</i>) catena, Heyd.	Turati
<i>var.</i> (<i>et ab.</i>) alpina, Bath	ochracea, Brem.
<i>var.</i> florinda, Butl.	Halpe, Moore
<i>var.</i> mixta, Alph.	lucasii, Mab.
<i>var.</i> manitoba, Scudd.	varia, Murr.
<i>var.</i> colorado, Scudd.	Padraona, Moore
<i>var.</i> idaho, Edw.	dara, Koll.
<i>var.</i> oregonia, Edw.	Gegenes, Hübn.
<i>var.</i> nevada, Edw.	nostrodamus, Fab.
<i>var.</i> laurentina, Lyman	Baoris, Moore
<i>var.</i> assiniboina, Lyman	zelleri, Led.
<i>var.</i> manitoboides, Fletch.	? thyone, Leech
<i>var.</i> columbia, Scudd.	pellucida, Murr.
<i>var.</i> juba, Scudd.	jansonis, Butl.
<i>var.</i> viridis, Edw.	Parnara, Moore
Augiades, Hb.	bada, Moore
boudha, Mab.	guttatus, Brem.
similis, Leech	Chapra, Moore
sylvanoides, Leech	mathias, Fab.
subhyalina, Brem.	alcides, H.-Sch.
<i>var.</i> thibetana, Obth.	<i>var.</i> ahriman, Chr.
<i>sylyvanus</i> , Esp.	cerulescens, Mab.
<i>ab.</i> paupera, Tutt	ISMENIDÆ.
<i>ab.</i> obsoleta, Tutt	ISMENINÆ.
<i>ab.</i> opposita, Tutt	ISMENIDI.
<i>ab.</i> clara, Tutt	Ismene, Swains.
<i>ab.</i> extensa, Tutt	<i>aquilina</i> , Spr.
<i>ab.</i> juncta, Tutt	? <i>jankowskii</i> , Obth.
<i>ab.</i> obscura, Tutt	Hasora, Moore
<i>var.</i> norvegica, Tutt	<i>anura</i> , Nicév.
<i>var.</i> (<i>et ab.</i>) anatolica,	Rhopalocampa, Wallgrn.
Plötz	<i>benjamini</i> , Guér.

The Lepidoptera of the southeastern district of London.

By WILLIAM WEST.

(Continued from p. 173.)

GEOMETRIDÆ.—*Abravas grossulariata*.—Bred from all parts on various foodplants; in 1870 I bred about 2000, and obtained one decent aberration; it had the base of the wing up to the yellow line black, beyond that was white, with the usual spots; I have also taken larvæ, entirely black, that had hibernated on tarred fences near blackcurrant trees. *A. ulmata*.—Abbey Wood; on elm. *Lyydia adustata*.—Kidbrook, Burnt Ash, and also Dartford. *Lomaspilis marginata*.—Dartford, Kidbrook, and Swanscombe. *Pachycnemia hippocastanaria*.—Shirley. *Hybernia rupicapraria*.—Bred on January 24th from larvæ taken at Kidbrook. *H. leucophaearia*.—Earliest date January 8th, lasting until March 6th; Shooter's Hill. *H. aurantiaria*.—Bred from birch; November 18th, at West Wickham. *H. progemmaria*.—Bred on March 8th; captured at Blackheath and Kidbrook. *H. defoliaria*.—Blackheath, Greenwich, Lee, and Lewisham. *Anisopteryx aescularia*.—Greenwich, Blackheath, and many other places. *Cheimatobia brumata*.—Blackheath, Lee, and other places. *C. boreata*.—West Wickham. *Oporabia dilutata*.—Blackheath, Lee, and also Lewisham. *Larentia didymata*.—Shirley and Shooter's Hill. *L. olirata*.—Wick-